Ipomopsis globularis (Brand) W.A. Weber (Hoosier Pass ipomopsis) Species Conservation Assessment Update

Title of Assessment: *Ipomopsis globularis* (Brand) W.A. Weber (Hoosier Pass ipomopsis): A Technical Conservation Assessment, USDA Forest Service, Rocky Mountain Region

Authors: Susan Spackman Panjabi and David G. Anderson

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Update Author: Susan Spackman Panjabi

Date of Update: August 15, 2006

Update Summary: Three specimens of *Ipomopsis globularis* that were collected in the 1800's were mentioned in the original assessment but were not listed as known occurrences because they were considered to be erroneous. I obtained the specimens on loan from the Smithsonian and Philadelphia Academy of Sciences herbaria, and reconfirmed their identification as *I. globularis*. The specimens are now considered to document two new possible locations, and have therefore been added to the table of occurrences and maps in this update. The locations are still in question because the habitat where the specimens were reported to be taken is different from all other known locations, and additional field work is warranted to determine the validity of these records. The "new" locations do not change the elevation range, associated species, or what is known about the threats to *I. globularis*. However, one of the locations is potentially in Clear Creek County on the Arapaho-Roosevelt National Forest; *I. globularis* has not otherwise been documented on this forest or in this county. The new locations expand the possible global range of the species from 20 x 30 miles to 23 by 48 miles (expanding the range to the north and to the west), and include new geological settings. *Ipomopsis globularis* was added to the USFS Region 2 Sensitive Species list in May 2006. However, the USFS has amended their Land Management Planning Handbook. Presumably, under the new rules, *I. globularis* will be called a "Species of Concern" rather than a "Sensitive Species". The impact of this new language to *I. globularis* remains to be seen. Colorado Native Plant Society members visited the Hoosier Ridge location for *I. globularis*, modified boundaries slightly, and made a careful count of this known occurrence. The new information obtained by this field visit does not change our understanding of this globally imperiled species. Photographs not reported in original assessment are now available. *Ipomopsis globularis* is listed as being for sale by Granite Gardens Rare Plants.

Distribution: New Information Provided
References: New References Provided
Additional Information: New Information Provided
Taxonomic Status: Unchanged
Agency Status: New Information Provided

Significance of Changes Relative to Original Assessment: New information available for *Ipomopsis globularis* does not require significant changes to the assessment for this species. Since the publication of this species assessment *I. globularis* was added to the USFS sensitive species list and two historically documented locations are considered to be possible additions to the known distribution of the species. However, most of the information cited in the assessment remains unchanged, and the threats to *I. globularis* have not abated. Thus, the discussion of threats and conservation in the assessment is still relevant. The nature of new information suggests that a rewrite of this assessment is not needed at this time. As additional new information becomes available in the future, the assessment will need to be updated.

Positive Findings of New or Updated Information and Their Sources

(Note: The Table A checklist attached to this update provides a summary of all sources consulted)

Source 1

Kratz, A. 2006. Personal communication with USFS Region 2 Botanist regarding the status of *Ipomopsis globularis*

Summary of New Information

Ipomopsis globularis was identified as a USFS Sensitive Species on May 17, 2005 based on its small population size and narrow global range. USFS mandates require that activities be managed to avoid disturbances that would result in a trend toward the federal listing or loss of population viability of Sensitive Species. Potential habitat must be surveyed and a biological evaluation must be written prior to activities that could impact Sensitive Species.

Relevant Sections of the Conservation Assessment Affected by the Updates

Summary of Key Components for Conservation, Introduction, Management Status

Source 2

Norbury, F. 2006. Forest Service Handbook, National Headquarters (WO) Washington, DC, Land Management Planning Handbook, Chapter 40--Science and Sustainability, Amendment No.: 1909.12-2006-5. Effective Date: January 31, 2006

Summary of New Information

This amendment describes the new planning rules and how the USFS will handle "Species of Concern" and "Species of Interest", rather than Sensitive Species. Presumably, *Ipomopsis globularis* will be considered a Species of Concern. The amendment states that species ranked G1-G3 by NatureServe will likely fall into this category. Individual forests will need to identify Species of Concern and Species of Interest as they develop new Forest Management Plans. Forests that have recently completed their planning process will follow the old rules, including use of the most recent Sensitive Species list (Cables 2006), until their next plan revision, typically after the plan is 10-15 years old (Kratz personal communication 2006). Biological evaluations will not necessarily be conducted for known or potential locations of Species of Concern or Species of Interest. In many cases the locations of these species will be covered under "ecosystem provisions" written into the Forest Plans. For example, the provisions may state that as long as alpine areas are managed to allow for a normal historic range of variation the species ought to be fine (Kratz personal communication 2006). The impacts of the new planning rules to *I. globularis* remain to be seen.

Relevant Sections of the Conservation Assessment Affected by the Updates

Summary of Key Components for Conservation, Introduction, Management Status, Existing regulations, Threats, Conservation elements

Source 3

Cable, R. 2006. Forest Service Manual, Rocky Mountain Region (Region 2), Denver, Colorado, Wildlife, Fish, And Sensitive Plant Habitat Management, Chapter 2670 – Threatened, Endangered And Sensitive Plants And Animals, Supplement No.: 2600-2006-1, Effective Date: May 3, 2006.

Summary of New Information

This supplement lists Sensitive Species for Region 2 and includes *Ipomopsis globularis*. This list will be used by Forests who have recently revised their Forest Management Plans and therefore will not be identifying Species of Concern and Species of Interest. White River National Forest, which supports occurrences of *I. globularis*, and Arapaho-Roosevelt National Forest, which potentially supports one occurrence of *I. globularis*, have recently revised their Forest Plans. These forests

will use the Sensitive Species list referenced here until the next plan revision, probably in 10-15 years (Kratz, personal communication 2006). The Pike-San Isabel National Forest, also known to support *I. globularis* is just starting their Forest Plan revisions, and will need to follow the new planning rules (Norbury 2006).

Relevant Sections of the Conservation Assessment Affected by the Updates

Summary of Key Components for Conservation, Introduction, Management Status

Source 4

Doyle, Georgia. 2006. Personal communication with Colorado Natural Heritage Program Botanist who attended Colorado Native Plant Society 2006 field trip to Hoosier Ridge regarding *Ipomopsis globularis* at this location.

Summary of New Information

Members of the Colorado Native Plant Society conducted field surveys at Hoosier Ridge, one of the known locations of *Ipomopsis globularis*, on July 21, 2006. The group worked to map populations and complete Colorado Natural Heritage Program Element Occurrence Records for *Ipomopsis globularis*, as well as *Armeria scabra*, *Eutrema penlandii*, and *Saussurea weberi*. The group observed that some of the area that had been mapped as supporting *I. globularis* was below tree line and did not contain suitable habitat for this species. The new boundaries do not significantly alter our understanding of the known distribution; they merely refine the known occurrence boundary. The Hoosier Ridge occurrence had last been observed on July 11, 2003, and had previously been estimated to support approximately 2000 individuals of *I. globularis* (Table 1). The total numbers gathered by the Colorado Native Plant Society were not available as of the completion of this update, but 2006 was apparently a very good year for *Ipomopsis globularis*. It was observed to flower abundantly, and a large population was observed.

Relevant Sections of the Conservation Assessment Affected by the Updates

Distribution and abundance, Table 1--last observation date for the Hooiser Ridge occurrence.

Source 5

Rocky Mountain Rare Plants. 2006. Accessed via the World Wide Web at http://www.rmrp.com/index.html.

Summary of New Information

A new photograph of *Ipomopsis globularis* is available on this web site, specifically at http://www.rmrp.com/Photo%20Pages/I/Ipomopsis%20globularis%20100DPI.htm.

Although this company does sell seeds of other alpine plant species, the seeds of *Ipomopsis globularis* are not listed as being for sale. The site does not provide any further information about *I. globularis* beyond the photograph.

Relevant Sections of the Conservation Assessment Affected by the Updates

Biology and Ecology: Classification and description: Published descriptions and other sources.

Source 6

Granite Gardens Rare Plants. 2006. Accessed via the World Wide Web at http://www.ggrareplants.com/.

Summary of New Information

Ipomopsis globularis was listed as being for sale under: Plant Selection Spring 2006. Plants were available for $5.50 each. Instructions state that the plants should be planted in sun to partial sun, and that the plants use low amounts of water. It is not known if this company collected plants or seeds

from the wild to obtain this species for sale, or whether or not the plant materials were collected on USFS or private lands. Future research efforts should address this threat to *I. globularis*.

Relevant Sections of the Conservation Assessment Affected by the Updates

Conservation: Threats: Collection for horticultural trade, Research priorities

Additional information

Summary of New Information

Ipomopsis globularis is known from at least nine locations in the vicinity of the Mosquito Range in Summit, Lake, and Park counties, Colorado (Table 1, Figure 1). Three historical herbarium specimens documenting two additional locations of *I. globularis* have been in question because the locations they are reported from, Gray's Peak and Mount Elbert, are not thought to support the habitat conditions necessary for *I. globularis* (Jennings personal communication 2006). It seemed that either the specimens were identified incorrectly, or the location information provided with the specimens was in error. Given and opportunity to update this assessment, I reviewed the specimens and other archived information, and determined that two "new" locations should be considered to be valid at this time: Mount Elbert in Lake County, and Gray's Peak in Summit County. Part of Gray's Peak is in Clear Creek County and on the Arapaho-Roosevelt National Forest, and this species has not otherwise been documented in this county or on this forest. Further searching in these areas is warranted to determine the full range of *I. globularis*. Although detailed studies of the geochemical and geophysical conditions required by *I. globularis* have not been conducted, the species is reported to occur on calcareous substrates at all of the other known locations, and Grays Peak and Mount Elbert do not have calcareous parent materials.

In an effort to determine the validity of the historical specimens from these unlikely locations, I worked with Jennifer Ackerfield, Herbarium Curator at the Colorado State University Herbarium to obtain the specimens on loan from the Lewis and Clark Herbarium at the Philadelphia Academy of Natural Sciences and the U.S. National Herbarium at the Smithsonian in Washington D.C. Working with Jennifer, I viewed the specimens and studied the keys and descriptions available in Wilken and Hartman (1991), the Intermountain Flora (1984), Harrington (1954), and Weber and Witmann (2001), and determined that the specimens were indeed identified correctly as *I. globularis*. Before viewing the specimens I thought that it was likely that the specimens.

could be misidentified collections of *I. congesta*, a common species known from lower elevations in the vicinity of known occurrences of *I. globularis*, and a species that has been mistaken for *I. globularis* by other botanists in the past (Hartman personal communication 2006). For example, at least one collection that is housed at the Rocky Mountain Herbarium at the University of Wyoming was originally identified as *I. globularis*, and later annotated to *I. congesta*. In fact, all three of the historical specimens in question were also originally identified as *I. congesta*, and annotated to *Gilia* (*Ipomopsis*) *spicata* ssp. *capitata* (*=I. globularis*) either by Constance and Rollins in 1936 or by D.H. Wilken in 1988. The original assessment provides information on the differences between these species.

Detailed information about each of the historical specimens follows, and is also summarized in Table 2. One of the specimens, housed in the Lewis and Clark Herbarium at the Philadelphia Academy of Sciences, was collected by an unknown collector and simply reads "Jul '75 Mt Elbert 83". This specimen was reported by Wilken and Hartman (1991) as being from Colorado, Lake Co., Mt. Elbert, and collected by Porter in July 1887. The specimen may indeed have been collected on Mt. Elbert in Lake County, Colorado; the year 1887 is likely a typographical error. The specimen was originally housed at the herbarium of Thomas C. Porter, as reported on the specimen label, but the collector is not known. Porter published the first flora of Colorado in 1874, and made many collections of his own, but I was unable to determine if he was on any collecting trips in 1875. I presume that 83 is the collection number. It is possible that this specimen was collected by J.M. Coulter, who is known to have collected plants for Porter, especially in areas with rugged terrain (Jennings personal communication 2006, Ewan 1950). We also know that Coulter collected in the

Sawatch Range (Ewan 1950), which includes Mount Elbert, and also on Mount Lincoln (Ewan 1950), which is one of the known locations for *Ipomopsis globularis*.

The other two specimens are duplicates of collection number 748 collected on Gray's Peak by Wolf and Rothrock, who were botanists on the well-known Wheeler Expedition of 1873. One specimen is housed in the Lewis and Clark Herbarium at the Philadelphia Academy of Sciences (PH), and the other in the U.S. National Herbarium at the Smithsonian (US). I attempted to verify the collection location by pursuing information about the travel routes of the Wheeler expedition, and also by pursuing information about other specimens with numerically adjacent collection numbers collected by Wolf and Rothrock in 1873. Rothrock and his accompanying scientists report that the expedition did travel through Georgetown and Clear Creek, Colorado (Rothrock 1878), which would have provided a favorable access to Grays Peak. A specimen of *Polemonium humile*, a Wolf collection number 685 in 1873, was reported as being collected from 12,000 feet on Gray's Peak, and *Castilleja pallida*, collection number 287 (presumably collected by Wolf), was also reported from Gray's Peak. However, collections locations are not always noted accurately. For example, perhaps they could see Gray's Peak from the collection location, but were not actually on the peak. Further, collection numbers at this time were sometimes organized in taxonomic sequence or some other way than simply chronologically as is typically done today (Jennings personal communication 2006).

Nonetheless, it may be safe to presume that Wolf and/or Rothrock did collect plants on Gray's Peak. Rothrock and his field partners reported much more vague directions on numerous other specimens, for example, "mountain parts of Colorado", or "mountains of Central Colorado", or "mountain ravines". And they did report more specific locations on other specimen labels, for example "Trout Creek", "Clear Creek", and "Mosquito Pass". It seems reasonable that they would not have reported Gray's Peak if they really didn't know what peak they were on. Gray's Peak certainly is a likely place these early explorers would have ventured.

Another possibility worth mentioning is that at some point between collecting and mounting, the specimens could have gotten separated from the correct location information. The geological settings of Gray's Peak and Mount Elbert, which are both composed of Precambrian rocks, are very different substrates than all other known locations of *Ipomopsis globularis*. All known locations of *I. globularis* are on calcareous substrates (Jennings personal communication 2006). Wolf and Rothrock did spend considerable time in South Park, and also at Mosquito Pass (Rothrock 1878) and these areas are in fairly close proximity to some of the known locations of *I. globularis*. Perhaps the specimens were collected within the known range of *I. globularis*, and the specimens from Mount Elbert and Gray's Peak are simply labeled incorrectly. Another argument that supports this theory, at least for Gray's Peak, is that it seems odd that *I. globularis* has not been documented in these areas again. For example, C.C. Parry collected plants in the vicinity of Gray's Peak in 1861-1872, Torry and Asa Gray climbed Grays Peak and collected plants there in 1872, E.L. Green, P.A. Rydberg, Alice Eastwood, and numerous present day botanists have also botanized on Gray's Peak and no one has again detected *I. globularis* (Jennings personal communication 2006). There are 191 specimens that mention Gray's Peak in the location information at the University of Colorado Herbarium (on-line database). However, the vast majority of the specimens were collected prior to 1955, well before botanists were aware of the significance of *I. globularis*, and many botanists tend to stay along well established routes and trails, especially when venturing above timberline.

In conclusion, in the absence of additional information about these historical plant collections, Gray's Peak and Mount Elbert are added as possible locations for *Ipomopsis globularis*, and field inventories for this species in these areas is warranted.

Relevant Sections of the Conservation Assessment Affected by the Updates

Summary of Key Components for Conservation, History of knowledge, Distribution and abundance, Habitat, Species inventory, Research priorities, Table 1, Figures 4 and 5.

Sources of Additional Information

(Note: Citations below dated prior to 2006 were also referenced in the original Assessment.)

Cronquist, A., A. H. Holmgren, N. H. Holmgren, J. L. Reveal, and P. K. Holmgren. 1984. Intermountain Flora- Vascular Plants of the Intermountain West, U.S.A. Volume 7

Four- Subclass Asteridae (escept Asteraceae). Bronx, NY: The New York Botanical Garden.

Ewan, J. 1950. Rocky Mountain Naturalists. University of Denver Press, Denver, CO.

Harrington, H. D. 1954. Manual of the Plants of Colorado. Denver, CO: Sage Books.

Hartman, R.L. 2006. Personal communication with Rocky Mountain Herbarium curator regarding collections of *Ipomopsis* species from Colorado.

Jennings, W.F. 2006. Personal communication with private consultant regarding distribution of *Ipomopsis globularis* in Colorado.

Rothrock, J.T. 1878. Reports upon the botanical collections made in portions of Nevada, Utah, California, Colorado, New Mexico, and Arizona during the years 1871-1875. Volume 6 in the Geographical Surveys West of the 100th Meridian, under the direction of G.M. Wheeler. Washington, Government Printing Office, 1885.

Weber, W. A. and R. C. Wittmann. 2001. Colorado Flora: Eastern Slope. Niwot, CO: University Press of Colorado.

Wilken, D. and R.L. Hartman. 1991. A revision of the *Ipomopsis spicata* complex (Polemoniaceae). Systematic Botany 16(1): pp. 143-161.

Additional Unabstracted Sources – *pre*-Assessment

(citations pre-dating Assessment publication that were not referenced in it).

None.

Additional Unabstracted Sources – *post*-Assessment

(citations post-dating Assessment publication that refer to the target genus but were determined by the reviewer to contain no information requiring an update of the original assessment)

Aldridge, G. 2005. Variation in Frequency of Hybrids and Spatial Structure Among *Ipomopsis* (Polemoniaceae) Contact Sites. New Phytologist 167: 279-288

Irwin, R. E. and L. S. Adler. 2006. Correlations Among Traits Associated With Herbivore Resistance and Pollination: Implications for Pollination and Nectar Robbing in a Distylous Plant. American Journal of Botany 93: 64-72.

Juenger, T., T. C. Morton, R. E. Miller, and J. Bergelson. 2005. Scarlet Gilia Resistance to Insect Herbivory: the Effects of Early Season Browsing, Plant Apparency, and Phytochemistry on Patterns of Seed Fly Attack. Evolutionary Ecology 19: 79-101.

Knight, T. M., J. A. Steets, J. C. Vamosi, S. J. Mazer, M. Burd, D. R. Campbell, M. R. Dudash, M. O. Johnston, R. J. Mitchell, and T. L. Ashman. 2005. Pollen Limitation of Plant Reproduction: Pattern and Process. Annual Review of Ecology Evolution and Systematics 36: 467-497.

Price, M.V., N.M. Waser, R.E. Irwin, D.R. Campbell, and A.K. Brody. 2005. Temporal and Spatial Variation in Pollination of a Montane Herb: a Seven Year Study. Ecology 86(8): 2106-2116.

Sage, T.L., M.V. Price, and N.M. Waser. 2006. Self-Sterility in *Ipomopsis aggregata* (Polomoniaceae) is Due to Prezygotic Ovule Degeneration. American Journal of Botany 93(2): 254-262.

Wu, C. A. and D. R. Campbell. 2005. Cytoplasmic and Nuclear Markers Reveal Contrasting Patterns of Spatial Genetic Structure in a Natural Ipomopsis Hybrid Zone. Molecular Ecology 14: 781-792. 9

Table 1. Updated from original assessment to include two "new" occurrences in last rows of the table. Summary information on the eleven known occurrences of *Ipomopsis globularis*. The first number reported under area is the number of acres of occupied habitat reported by an observer. The second number is the area calculated in Arc View from the map provided by an observer. There may be more than one observer for each occurrence.

Name	CNHP EO number[a]	Last observed	Area (Acres) Reported/arc view calc.	Est. population size	Elevation (ft)	Land ownership/ management
Hoosier Ridge	001	2003-07-11	9/808	2000	11,540-13,200	White River NF, Pike NF, private
North Star Mountain	003	2000-08	2/5	200-300	11,760-12,200	Pike NF, White River NF, possibly private
Mount Lincoln	004	1985-07-19	1/41	3,000	12,000-13,800	Pike NF and private
Boreas Pass	008	2003-07-15	8/878	1,210	10,520-13,010	Pike NF, White River NF, and private
Weston Pass	010	2000-07-28	17 /1326	200-3,000	11,600-12,695	Pike NF, San Isabel NF and private
Cooper Creek	011	1985-07-17	Not reported	Locally frequent	12,160-12,320	Pike NF and private
Dolly Varden Gulch	012	1994-07-22	40/7	100-1,000	12,400-12,800	Pike NF and private
Sheep Mountain	014	1985-07-09	Not reported	Not reported	12,200	Pike NF and private
Horseshoe Gulch	016	1985-07-16	Not reported	Not reported	12,400	Pike NF and private
Mount Elbert	new	1875-07	Not reported	Not reported	Not reported	San Isabel NF
Gray's Peak	new	1873	Not reported	Not reported	10,00-12,000	White River and/or Arapaho NF
Totals	---	---	77-3065	6,710-10,510+ (est. 6-11,000)	---	

a: Colorado Natural Heritage Program Element Occurrence Number (Colorado Natural Heritage Program 2003)

Table 2. Information available to support locations in question. All information taken directly from herbarium labels. Specimens were all originally identified as *Gilia congesta* Hooker, were annotated to *Gilia spicata* var. *capitata*, and then to *Ipomopsis spicata* ssp. *capitata*. No additional information, such as elevation, aspect, or habitat was provided on specimen labels. The specimens do all look very much alike, as if they all could have been collected at the same time and location. They are roughly the same size, and the same flowering stage (Jennings personal communication 2006).

Location	**Date**	**Collector**	**Collection number**	**Repository**
Mt Elbert	July '75	unknown	83	PH, from the Herbarium of Thomas C. Porter
Grays Peak (10-12,000 ft. reported on one specimen label)	July, 1873	Wolf or Wolf and Rothrock (reported differently on the duplicate specimens.	748	Duplicate specimens deposited at the U.S. National Herbarium at the Smithsonian (US), and the Lewis and Clark Herbarium at the Philadelphia Academy of Natural Sciences (PH)

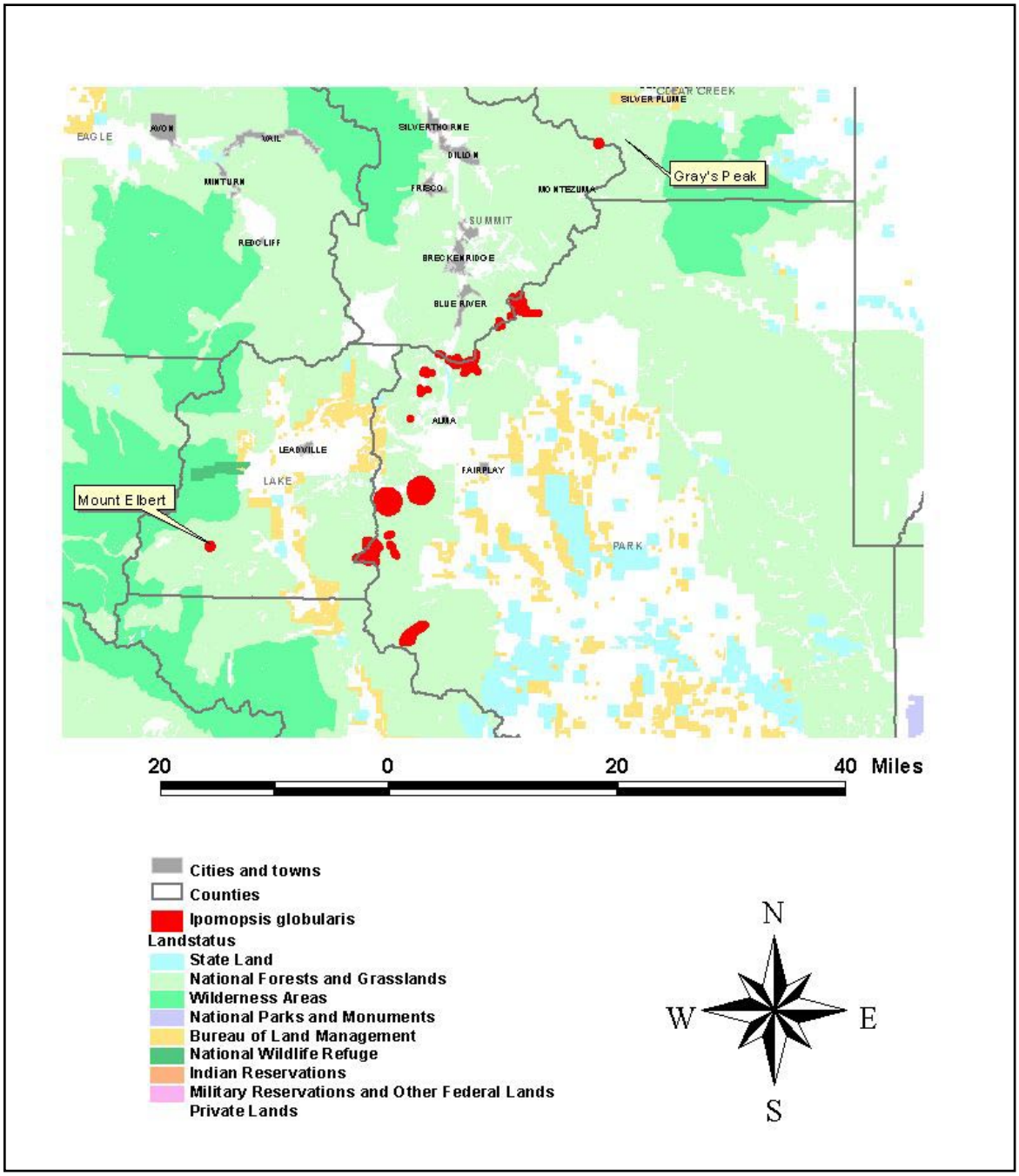

Figure 1. Update to Figure 4 in the Conservation Assessment (March 2005). Global distribution of Ipomopsis globularis. Occurrences in Summit County are in the White River National Forest. The Gray's Peak occurrence could also be in Clear Creek County on the Arapaho-Roosevelt Nation

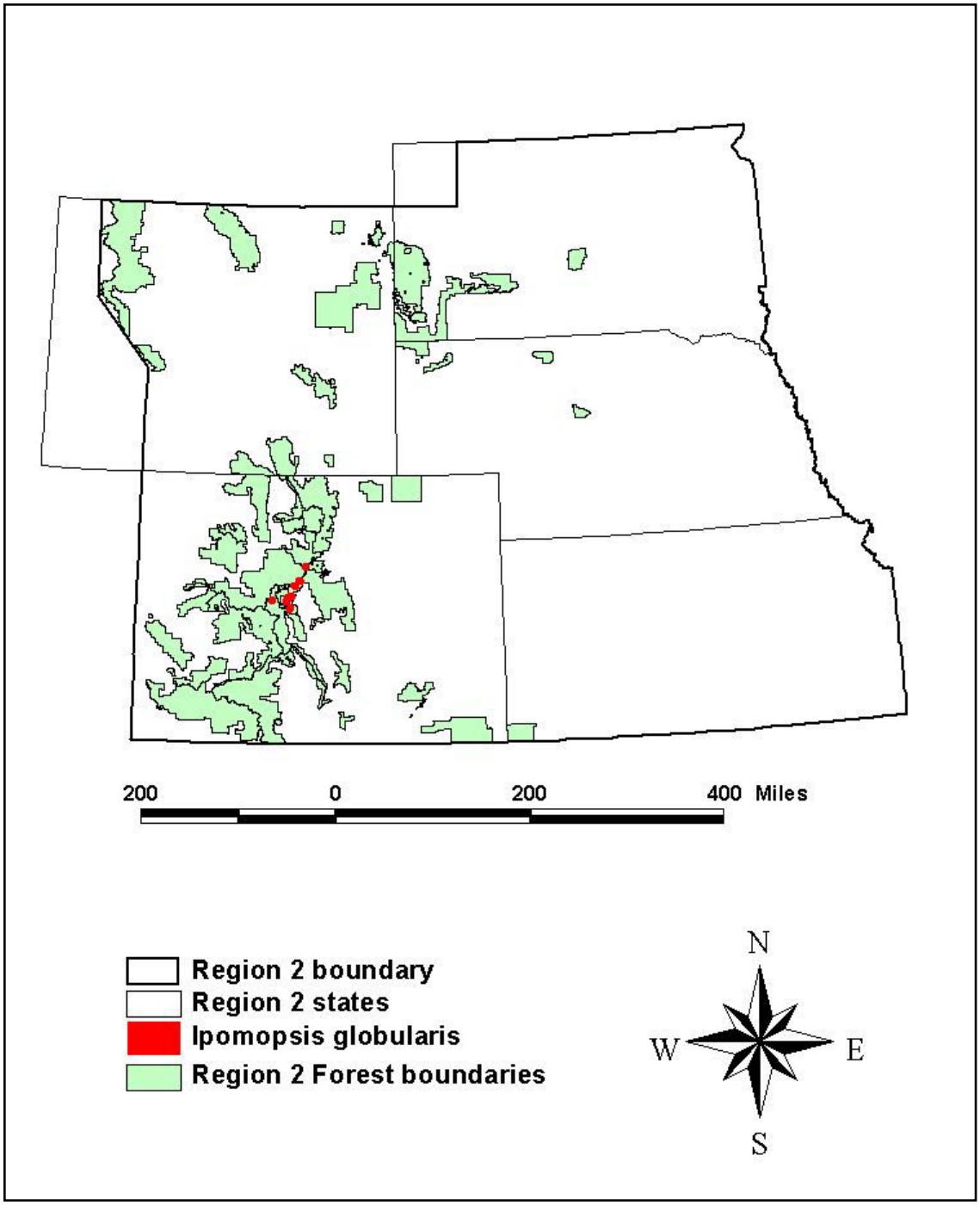

Figure 2. Update to Figure 5 in the Conservation Assessment (March 2005). Distribution of *Ipomopsis globularis* in relation to lands managed by the USDA Forest Service Rocky Mountain Region.

Checklist of Sources Consulted for Updates to the *Ipomopsis globularis* Conservation Assessment

Guidelines for Producing Updates

Sources of information relevant to review of this Technical Conservation Assessment for updates include databases, museums and herbaria, primary experts, personal communications, published and unpublished technical literature and data, recent Forest Service or USDA policy-related publications, and other Forest Service agency announcements. Positive results are discussed in detail in the Summary of Addendum to the Technical Conservation Assessment.

For internet-based literature searches, the minimal search for each update includes Google Scholar, Federal Register, plus a minimum of three other available online literature databases. Search terms include at a minimum the species common name, genus and specific ephitet, and recent synonyms. Note that some plants do not have common names. Other keywords will be used at the discretion of the reviewer (e.g., passerine, wetland, rodent). Searches are constrained to the time period from two years prior to publication of the Technical Conservation Assessment (or from the most recent update to the Assessment) to the present.

Experts and relevant agency personnel should also be contacted for updated information on the species.

Table A. Sources of information consulted for updates to the Species Conservation Assessment.

Source Category	Source/ Name	Date	Results
Announcement from R2 to all FS personnel (including species list)			No announcement was made
Internet based literature databases	Google	5/16/2006	search terms: Ipomopsis globularis- 363 hits, I checked all. New information regarding sensitive status (USFS), see reference 3; new info from granite gardens, see reference 6; new photo available on Rocky Mt. Rare Plants website, see reference 5; CONPS field trip to target this species on Hoosier Ridge in 2006, see reference 4.
	Google Scholar	5/17/2006	search term: Ipomopsis globularis. 11 hits. No new information.
	Google Book Search	5/17/2006	No new sources for search term: Ipomopsis globularis
	Federal Register	5/17/2006	No new sources for search terms: Ipomopsis AND globularis
	CSU Library Catalog	5/17/2006	No new sources for search terms: Ipomopsis AND globularis
	Prospector (searches multiple university libraries in Colorado)	5/17/2006	No new sources for search term: Ipomopsis OR globularis
	Scopus	5/17/2006	No new sources for search terms: "Ipomopsis globularis", Ipomopsis AND globularis. New sources not specific to I. globularis were found for search term Ipomopsis- see unabstracted references.
	Web of Science	5/17/2006	No new sources for search terms: Ipomopsis globularis. New sources not specific to I. globularis were found for search term Ipomopsis- see unabstracted references.
	Agricola	5/17/2006	No new sources for search term: Ipomopsis globularis

Source Category	Source/ Name	Date	Results
	Biological Abstracts	5/17/2006	No new sources for search term: Ipomopsis globularis. New sources for search term: Ipomopsis added to unabstrated references.
	WorldCat Dissertations and Theses Database	5/17/2006	No new sources for search term: Ipomopsis globularis
NatureServe affiliate program databases and personnel	Colorado Natural Heritage Program database.	5/17/2006	No new occurrence data.
State Agency Personnel	Brian Kurzel	Not contacted	Information on Hooiser Ridge field trip obtained from Georgia Doyle, Colorado Natural Heritage Program.
Federal Agency Personnel	Andrew Kratz	5/17/2006 and 8/8/2006	New information- see reference 1.
Primary experts	Georgia Doyle	8/1/2006	New information. See reference 4.
Museums and Herbaria	University of Colorado (COLO)	5/17/2006	No new specimens
	Colorado State University (CS)	5/17/2006	No new specimens
	Smithonian Herbarium	5/3/2006-8/9/2006	Specimens on loan at CSU Herbarium. Worked with Jennifer Ackerfield, CSU Herbarium curator to verify specimen identification. See Additional inforamtion.
	National Academy of Science herbarium in Philadelphia	5/3/2006-8/9/2006	Specimens on loan at CSU herbarium. Worked with Jennifer Ackerfield, Herbarium curator to verify specimen identification. See Additional information.
Original Author			Author is responsible for addendum